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QUESTION 3: Should a synovectomy routinely be performed during arthroscopic treatment of an acute infection following anterior cruciate ligament reconstruction (ACLR)?

RECOMMENDATION: No. Total or partial synovectomy should be reserved for cases of severe or chronic infection.

LEVEL OF EVIDENCE: Limited

DELEGATE VOTE: Agree: 100%, Disagree: 0%, Abstain: 0% (Unanimous, Strongest Consensus)

RATIONALE

According to Gaechter and the proposed classification, the synovial membrane serves as a natural barrier in infection [1,2]. As a result, a primary synovectomy should be avoided in acute infections except for later stages [1,2]. The four stages of joint infection described by Gaechter were:

Stage I: Synovitis, turbid fluid, possible petechiae

Stage II: Fibrin clots, franc pus

Stage III: Thickening of the synovial membrane (up to several centimeters), multiple pouches due to adhesions

Stage IV: Pannus. Aggressive synovitis, radiographically visible changes, subchondral erosions

Klein et al. suggested a stage-oriented therapy for the treatment of bacterial joint infections in 1989, based on three stages of infection, which largely coincided with the stages I to III according to Gaechter [3].

An extensive irrigation of the joint and removal of all hematoma, fibrin deposits and partial synovectomy should be performed when synovitis is present [4,5]. In the presence of cartilage erosions in the joint or additional septa, a subtotal synovectomy is recommended [3]. Other studies advocate for a synovectomy during the first irrigation and debridement procedure, with fair results [6,7]. Zalavras et al. reported a successful outcome following a complete synovectomy [8]. More recent papers again recommend a synovectomy only in stages III and IV [9].

Prompt recognition of an infection and intervention with irrigation and debridement alone can prevent the need to remove ligament grafts and hardware. Therefore, a synovectomy should not be routinely performed during arthroscopic treatment of an acute infection following ACLR. However, this issue has not been well studied, and further studies are needed to address the influence of synovectomy in the management of infected ACLR.

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QUESTION 4: Should the graft and all hardware be removed in the treatment of patients with an acute infection following anterior cruciate ligament reconstruction (ACLR)?

RECOMMENDATION: The initial approach to an acute infection following ACLR should be arthroscopic irrigation and debridement, retention of a stable graft and hardware and intravenous antibiotic therapy.

LEVEL OF EVIDENCE: Moderate

DELEGATE VOTE: Agree: 100%, Disagree: 0%, Abstain: 0% (Unanimous, Strongest Consensus)

RATIONALE

The incidence of septic arthritis after anterior cruciate ligament (ACL) surgery is low (0.14 to 2.25%) [1]. In acute postoperative infections, graft and hardware removal versus retention remains controversial with the goal being to eradicate the infection, preserve the articular cartilage and retain a functioning graft.

A prospective study by Abdel-Aziz et al. analyzed 2,560 ACL procedures with 24 cases of septic arthritis, with a mean follow-up of five years. In all patients, arthroscopic surgical debridement was performed (average three procedures), followed by intravenous antibiotic treatment. In all 24 cases, infection was eradicated with this protocol. No functional differences were found compared to control group according to Lysholm, International Knee Documentation Committee (IKDC) and Knee Injury and Osteoarthritis Outcome Score (KOOS) ratings [2]. Likewise, Schuster et al. reviewed more than 7,000 ACLRs, identifying a total of 36 cases of acute postoperative infections. The graft was retained in all but one case (97.2%) with a mean of 2.25 (+/-1.22 SD) procedures required to treat the infection [3].

In a meta-analysis, Kuršumović et al. reported a success rate of 85% for graft retention and infection eradication [4]. They analyzed 16 studies with a total of 147 knee infections after ACLR. Increased rates of failure were seen in cases with persistent infection requiring subsequent procedures, from 4.4% with one arthroscopic debridement, to 11.4% with two procedures, or 25% with more than three surgeries [4]. In a similar systematic review, Makhni et al. analyzed 19 studies with a total of 203 cases of septic arthritis following ACLR and reported a success rate with graft retention of 78% [5].

Wang et al. also demonstrated success after serial irrigation and debridement and intravenous antibiotics. In addition, they demonstrated a greater graft retention rate when infection was diagnosed and treated immediately (< 7 days) suggesting a crucial time constraint to treatment [1].

Therefore, the data suggests that the initial approach to acute postoperative infection after ACLR should be to attempt to retain the graft and hardware. However, there are cases in which removal should be considered, which may include presence of gross purulence, when infection is resistant to multiple irrigations and debridement, possible bony involvement of the tibia or femur and/or a non-functional graft [6,7].

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